Inventions & Innovation Project Abstract

Eco Oil – A Superior-Performance, Bio-Based Motor Oil

Peaks & Prairies, LLC is completing the research and development of Eco Oil, an enhanced, bio-based synthetic motor oil. Bench-scale tests of early Eco Oil formulations have demonstrated increased fuel mileage of 3-5%, an estimated 4-5 base horsepower gain, and a 68% to 80% reduction in NOx. Building on these promising results, the proposed Category 2 effort will focus on identifying the optimal formulation of three key components—(1) Lesquerella oil, which exhibits favorable hydroxy fatty-acid properties comparable to Castor oil; (2) our base canola oil; and (3) a patented estolide technology formulation.

Working cooperatively with USDA NCAUR (National Center for Agricultural Utilization Research) and the Southwest Research Institute, Peaks & Prairies will develop and test a series of specific formulations designed to optimize the unique benefits of each of the three components. These tests include; oxidative stability, wear, flash point, pour point, viscosity index and advanced engine testing. The Category 2 research will lead to a final formulation that Peaks & Prairies can then put into production in its Malta, MT manufacturing plant. The company's commercialization plan initially targets the U.S. Military. Peaks & Prairies is currently pursuing a CRADA with the U.S. Army's TARDEC, Tank Automotive Research Development and Engineering Center, in Michigan, which has expressed early interest in the Eco Oil concept. The Army CRADA efforts will be furthered with the results from our current testing agreement and results. Subsequent commercialization activities will target, in order, Federal and State contracts, commercial fleet operators and then consumers. 100% market adoption would save in excess of 280 trillion BTUs; a more reasonable 18% market penetration by year 2016 is projected to save in excess of 50 trillion BTUs annually.

Peaks & Prairies' Eco Oil synthetic motor oil can help reduce refined petroleum consumption, adding stability to our national supply. Increases in biobased motor oil availability also provide product diversity, creating additional options for Federal, State and consumer purchases. Further, testing of the biobased oil has demonstrated considerable immediate reductions in vehicle emissions. Results have shown a measurable reduction in NMCH, HC and NOx as well as CO2. Reductions from the petroleum standard were NHMC: 25%; CO: 48%; HC: 32%; NOx: 80% and CO2: 1%.

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